



Small Pulper



The Small Pulper processes shipboard food, cardboard and paper waste (including classified documents) into a non-floating slurry that can be discharged overboard. The Small Pulper is intended for smaller size ships that do not have the space or require the high processing capability of the Large Pulper.

The Small Pulper allows the U.S. Navy to comply with the National Defense Authorization Act for Fiscal Year 1997. This legislation allows for the discharge of pulped paper, cardboard, and food waste from U.S. Navy ships beyond three nautical miles from U.S. or foreign coastlines, including special areas.

The Small Pulper is designed to resist damage if trash sorting errors occur and metal, glass, or other non-pulpable materials are placed into the unit. Metal and glass debris that may not have been sorted before it was loaded into the pulper are separated from the slurry by gravity, forced to the bottom of the tank and collected in a "junkbox," which is emptied manually after the pulper is shut down. Plastic items inadvertently loaded into the pulper are partially shredded and retained within the pulping chamber. They may also be manually removed after the unit is shut down.

Small Pulpers have successfully completed multiple shipboard evaluations on U.S. ships. In 1997, the United States Navy awarded two production contracts to procure Small Pulpers for smaller size ships. Small Pulper installations aboard U.S. Navy ships will be completed by 31 December 2000.

The Small Pulper is easy to use and is designed to meet rugged operating conditions of a navy ship.

EQUIPMENT CHARACTERISTICS

Performance:

Processing Rate: 100 pounds (45 kg)/hr paper and cardboard
200 pounds (91 kg)/hr food waste
140 pounds (64 kg)/hr mixed waste

Output: Wet slurry (1% to 2% solid by weight)

Envelope:

Weight: Pulper wet 925 pounds (420 kg)
Pulper dry 775 pounds (352 kg)
Control Enclosure 130 pounds (60 kg)

Footprint: 72 inches (1.8 m) wide by 26 inches (0.66 m) deep by 65 inches (1.7 m) high
76 inches (1.9 m) wide by 60 inches (1.5 m) deep by 72 inches (1.8 m) high

Maintenance and Operational Envelope: Bulkhead mounted (same compartment);
30 inches (77 cm) long by 8 inches (21 cm) wide by 30 inches (77 cm) high

Services:

Electrical Power Supply: 440 Volts alternating current, three-phase, 25 Amps, 60 Hertz

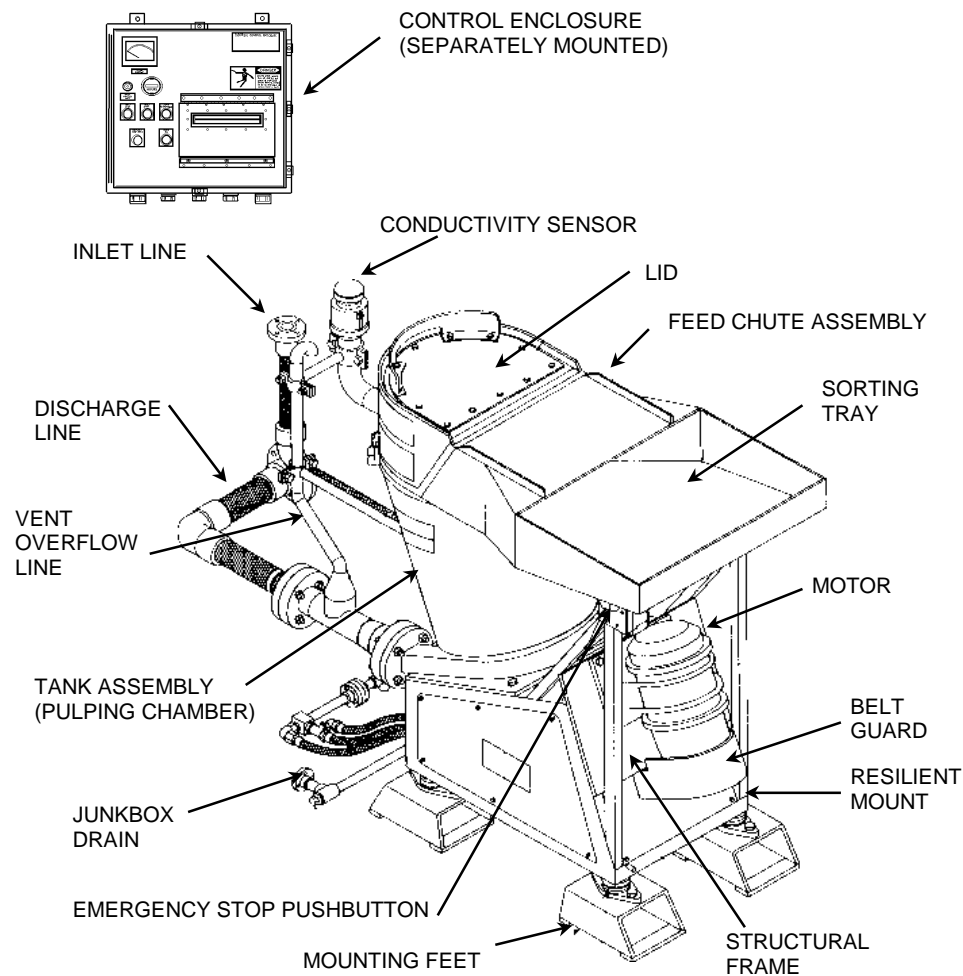
Seawater Supply (including eductor supply): 50 gallons per minute (3 L/s) strained

Compressed Air Supply: 1.0 standard cubic feet per minute (0.47 L/s) intermittent;
80 pounds per square inch (551 kPa) to 125 pounds per square inch (861 kPa)
1.5 inches (3.8 cm)

Recommended Seawater Supply Line Size:

Recommended Discharge Line Size: 2.5 inches (6.6 cm)

SMALL PULPER





The Small Pulper is Easy to Operate:

- The operator sorts waste on the feed tray to remove non-pulpable items such as metal, glass and plastic. The operator then pushes the paper and food waste into the stainless steel pulping tank. Seawater flow, at 25 gallons per minute (1.5 liters per second) is mixed with the waste. A quiet, cascading orificial restrictive device throttles the seawater flow from the shipboard firemain.
- A 7.5-hp (5.6-kW) motor rotates a two-bladed impeller at high speed past five stationary cutters. The impeller pulps the waste and generates a vortex to mix the seawater and waste. Separate air-operated valves allow water to the pulping tank and to the eductor.
- The processed pulp exits the pulping tank by gravity through 1/4-inch (0.64-cm) holes in a security ring (strainer). An 25-gallon per minute (1.5 liter per second) seawater eductor dilutes the slurry to less than 2% solid and discharges the waste overboard.
- The control system sequentially starts up and shuts down the Pulper. It alerts the operator to stop feeding the Pulper when the motor is overloaded. The control system stops the Pulper and shuts the seawater valves if the lid is opened, if the pulping tank overflows, or if firemain seawater flow is lost.
- The operator cleans non-pulpable waste residue from the junkbox and pulping tank after shutdown.

The Small Pulper is resiliently mounted and easily fits through a standard 26-by 54-inch (66-by 137-cm) hatch.

The wetted parts are 316-L stainless steel, except for the piping, which is 90/10 copper nickel. All structural non-wetted parts are 304 stainless steel.



Manning, Training, and Safety Requirements:

- Manpower requirements for operation can be met by the ship's complement of food mess or storekeeper type personnel.
- The Small Pulper is considered as typical hull, machinery and electrical type equipment for maintenance purposes.
- A computer-based training curriculum has been developed to effectively train operator and maintenance personnel.
- The Small Pulper is outfitted with a number of safety devices and interlocks designed to prevent injury to the operator.
- Small Pulper operators are required to wear gloves, apron, face shield and hearing protection.

Equipment Compatibility/Operability

- The Small Pulper is designed and tested for shock, vibration, electromagnetic interference, airborne/structureborne noise, and magnetic compatibility.
- Isolation valves are installed between the Small Pulper and all fluid systems.
- A power disconnect switch is installed between the Small Pulper and the ship's electrical system.

Logistics and Maintenance Support:

- Technical Manuals to operate, maintain, troubleshoot and repair the equipment are provided.
- Detailed step-by-step scheduled preventive maintenance procedures are provided.
- Repair parts are readily available.
- Minimal special tools are required.

- The Small Pulper processes shipboard food, cardboard and paper waste.
- The Small Pulper is intended for small size ships that do not have the space or require the high processing capability of the Large Pulper.
- The Small Pulper is easy to use and requires minimal training.
- All components of the Small Pulper are made from corrosion resistant materials.
- A computer-operated message display simplifies operation and helps troubleshoot problems.
- One sailor can easily and safely operate the Small Pulper.

FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

Carderock Division Naval Surface Warfare Center

9500 MacArthur Blvd,
West Bethesda, Maryland 20817-5700

Point of Contact: Peter McGraw
Solid Waste Management Branch, Code 634
(301) 227-5155



SMALL PULPER KEY FEATURES

